CLAIMS

WHAT IS CLAIMED IS:

1. A hybrid enzyme which has a partial substitution or an insertion of a peptide containing a part of an amino acid sequence represented by SEQ ID NO:1, in which

said hybrid enzyme has the same enzyme activity as an original enzyme without the substitution or the insertion of said peptide,

and said hybrid enzyme activity is modulated when a material having binding ability to said peptide introduced by the substitution or the insertion is bound to the peptide moiety.

2. The hybrid enzyme according to claim 1, in which the peptide comprises an amino acid sequence having at least 6 or more sequential amino acid residues selected from the amino acid sequence of SEQ ID NO: 1.

3. The hybrid enzyme according to claim 2, in which the peptide has a property of being capable of binding to a material having binding ability to C-reactive protein.

4. The hybrid enzyme according to claim 1, in which the peptide comprises an amino acid sequence having at least 6 or more sequential amino acid residues selected from any one of SEQ ID NO: 2 through SEQ ID NO: 5.

5. The hybrid enzyme according to claim 1, in which the original enzyme is a glucose-6-phosphate dehydrogenase, a β-galactosidase or an alkaline phosphatase.

6. The hybrid enzyme according to claim 1, in which the material having binding ability to the peptide is an antibody.

7. A reagent for measurement of C-reactive protein comprising the hybrid enzyme according to any one of claims 1 through 6.

8. The reagent according to claim 7 further comprising an

anti-C-reactive protein antibody.

9. A kit for measurement of C-reactive protein containing a reagent comprising the hybrid enzyme according to any one of claims 1 through 6.

10. The kit according to claim 9 further comprising an anti-C-reactive protein antibody.

11. A method for measurement of C-reactive protein which is characterized in using the hybrid enzyme according to any one of claims 1 through 6.

12. The method according to claim 11 further comprising using an anti-C-reactive protein antibody in combination.

13. A method for measurement of C-reactive protein comprising bringing a sample containing C-reactive protein, the enzyme according to any one of claims 1 through 6 and an anti-C-reactive protein antibody into contact with one another, then measuring activity of the enzyme, and determining the amount of C-reactive protein in the sample based on the resulting enzyme activity.

14. A hybrid enzyme having a peptide introduced into a specific position of a glucose-6-phosphate dehydrogenase by insertion or substitution.

15. The hybrid enzyme according to claim 14, in which the specific position is a position at which the glucose-6-phosphate dehydrogenase activity can be maintained even by the insertion or substitution of a peptide having 6 or more amino acid residues.

16. The hybrid enzyme according to claim 14, in which the specific position is a position at which the glucose-6-phosphate dehydrogenase activity is modulated when a material having binding ability to the peptide introduced by insertion or substitution is bound to said peptide.

17. The hybrid enzyme according to claim 14, in which the specific position is any position selected from the group consisting of the position between 294-295, between 302-310, between 362-363, the N-terminal and the C-terminal of the amino acid sequence of glucose-6-phosphate dehydrogenase represented by SEQ ID NO: 6.

18. The hybrid enzyme according to claim 14, in which the peptide is selected from the amino acid sequence of C-reactive protein.

19. The hybrid enzyme according to claim 14, in which the peptide has a character that there is a material having binding ability specifically to the part of the hybrid enzyme in which the peptide is substituted or inserted.

20. A reagent for measurement of a material containing the peptide introduced into the hybrid enzyme according to any one of claim 14 through 19 by insertion or substitution, which comprises the hybrid enzyme according to any one of claims 14 through 19.

21. A kit for measurement of a material containing the peptide introduced into the hybrid enzyme according to any one of claim 14 through 19 by insertion or substitution, which comprises the hybrid enzyme according to any one of claims 14 through 19.

22. A method for measurement of a material containing the peptide introduced into the hybrid enzyme according to any one of claim 14 through 19 by insertion or substitution, which is characterized in using the hybrid enzyme according to any one of claims 14 through 19.

23. A method for measurement of a material containing the peptide, which comprises using the hybrid enzyme according to any one of claims 14 through 19 in combination with a material having binding ability to the peptide introduced into the hybrid enzyme by insertion or substitution.

24. A method for measurement of a material containing said peptide introduced into the hybrid enzyme according to any one of claim 14 through 19, which comprises bringing the hybrid enzyme according to any one of claims 14 through 19, a sample containing a material containing the peptide introduced into said hybrid enzyme by insertion or substitution and a material having binding ability to said peptide into contact with one another, then measuring activity of said hybrid enzyme, and determining the amount of the material containing said peptide in the sample based on the resulting enzyme activity.

25. A reagent for measurement of a material having binding ability to the peptide introduced into said hybrid enzyme according to any one of claim 14 through 19 by insertion or substitution, which comprises the hybrid enzyme according to any one of claims 14 through 19.

26. A kit for measurement of a material having binding ability to the peptide introduced into said hybrid enzyme according to any one of claim 14 through 19 by insertion or substitution, which comprises the hybrid enzyme according to any one of claims 14 through 19.

27. A method for measurement of a material having binding ability to the peptide introduced into said hybrid enzyme according to any one of claim 14 through 19 by insertion or substitution, which comprises using the hybrid enzyme according to any one of claims 14 through 19.

28. A method for measurement of a material having binding ability to said peptide introduced into the hybrid enzyme according to any one of claim 14 through 19, which comprises bringing the hybrid enzyme according to any one of claims 14 through 19 into contact with a sample containing a material having binding ability to the peptide, then measuring an activity of said hybrid enzyme, and determining the amount of the material having

binding ability to said peptide in the sample based on the resulting enzyme activity.

29. A gene coding for a hybrid enzyme comprising an amino acid sequence into which a foreign peptide is introduced by substitution or insertion at any position selected from the group consisting of the position between 294-295, between 302-310, between 362-363, the N-terminal and the C-terminal of the amino acid sequence of glucose-6-phosphate dehydrogenase represented by SEQ ID NO: 6.

30. A recombinant DNA, which is characterized in inserting the hybrid enzyme gene according to claim 29 into a vector DNA.

31. A transformant or a transductant comprising the recombinant DNA according to claim 30.

32. A method for producing a protein having enzyme activity of glucose-6-phosphate dehydrogenase and a property that the glucose-6-phosphate dehydrogenase activity is modulated when a material having binding ability to an amino acid sequence introduced into glucose-6-phosphate dehydrogenase by substitution or insertion is bound to the amino acid sequence, which comprises cultivating the transformant or the transductant according to claim 31, and collecting the protein.

33. A gene coding for a hybrid enzyme comprising an amino acid sequence into which an amino acid sequence, which can be cleaved with a restriction enzyme, is introduced by substitution or insertion at any position selected from the group consisting of the Asp294 position, the Leu302 to Asp310 positions, the Glu362 position, the N-terminal and the C-terminal of the amino acid sequence of glucose-6-phosphate dehydrogenase represented by SEQ ID NO: 6.

34. A recombinant DNA, which is characterized in inserting the

hybrid enzyme gene according to claim 33 into a vector DNA.

35. A hybrid enzyme in which a peptide selected from an amino acid sequence represented by SEQ ID NO: 1 is introduced into a specific position of a β-galactosidase by insertion or substitution.

36. The hybrid enzyme according to claim 35, in which the specific position is either selected from the position between 280-281 and between796-797 of an amino acid sequence of a β-galactosidase represented by SEQ ID NO: 30.

37. A gene coding for the hybrid enzyme according to claim 36.

38. A recombinant DNA, which is characterized in inserting the hybrid enzyme gene according to claim 37 into a vector DNA.

39. A transformant or a transductant comprising the recombinant DNA according to claim 38.

40. A method for producing a protein having an enzyme activity of a β-galactosidase and a property that the β-galactosidase activity is modulated when a material having binding ability to an amino acid sequence introduced into the β-galactosidase by substitution or insertion is bound to the amino acid sequence, which comprises cultivating the transformant or the transductant according to claim 39, and collecting the protein.

41. A hybrid enzyme in which a peptide selected from an amino acid sequence represented by SEQ ID NO: 1 is introduced into a specific position of an alkaline phosphatase by insertion or substitution.

42. The hybrid enzyme according to claim 41, in which the specific position is any one selected from the position between 167-168, between 168-169, btween 407-408, between 91-93 and between 169-177 of an amino acid sequence of an alkaline phosphatase represented by SEQ ID NO: 31.

43. A gene coding for the hybrid enzyme according to claim 42.

44. A recombinant DNA, which is characterized in inserting the hybrid enzyme gene according to claim 43 into a vector DNA.

45. A transformant or a transductant comprising the recombinant DNA according to claim 44.

46. A method for producing a protein having an enzyme activity of an alkaline phosphatase and a property that the alkaline phosphatase activity is modulated when a material having binding ability to an amino acid sequence introduced into the alkaline phosphatase by substitution or insertion is bound to the amino acid sequence, which comprises cultivating the transformant or the transductant according to claim 45, and collecting the protein.

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